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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/974,048	10/11/2001	Toshio Shtntani	Q66510	7616

7590 07/02/2003

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EXAMINER

DINH, TUAN T

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary**Application No.**

09/974,048

Applicant(s)

SHINTANI ET AL.

Examiner

Tuan T Dinh

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

The request filed on May 20, 2003 for a Request for Continued Examination (RCE) under 37 CFR 1.14 based on parent Application No. 09/974048 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-5 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Omote et al. (U. S. Patent 5,858,518) in view of Hashimoto et al. (U. S. Patent 6,225,569) and further in view of Lubrano et al. (U. S. Patent 4,778,733) or Tucker et al. (U. S. Patent 4,929,423).

As to claims 1 and 3-5, Omote discloses a circuit board formed suspension substrate (1-figure 1, column 8, line 22, claim 4) comprising:

a terminal portion (5, 6-figure 2, column 8, line 31), said terminal portion provided with a nickel plating layer (28-figure 2, column 8, lines 40-41);

wherein a thickness of said nickel plating layer (32-figure 13) is within a range of 1.0 to 4.0 μ m (column 10, lines 26-30),

wherein said terminal portion (5; 6) further includes a base layer (7), and a conductive layer (3, column 8, line 26) disposed between said base (7) and said nickel plating layers (28), wherein a thickness of said base layer (7) comprises polyimide resin (column 8, line 36).

Omote does not disclose a solder ball on the terminal portion connected with an external terminal formed in an external circuit.

Hashimoto shows a terminal portion (11) having a solder ball (33) connected with an external portion (32) formed in an external circuit (31) disclosed in figures 1-3.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a solder ball on the terminal portion connected with an external terminal formed in an external circuit as taught by Hashimoto to employ the circuit board of Omote in order to provide an physical/electrical connection between two devices or circuit boards.

Omote and Hashimoto disclose all of the limitations of the claimed invention, except for a soldering bump containing tin-silver-copper (tin-95-97%, copper-0-4%, and silver-0-4%), and (0.3-3.5%) by weight of said silver and (0.2-1.2%) by weight of said copper.

Lubrano teaches a soldering bump containing tin-silver-copper in order of (92-99%)-(0.05-3%)-(0.7-6%) (see column 1, lines 28-31).

Tucker shows a composition of solder containing tin-silver-copper in order of (91-99.25%)-(0.05-3%)-(0.7-6%) respectively, see column 1, lines 21-25.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a soldering bump containing tin-silver-copper as well known and conventional in the art as taught by Lubrano or Tucker to employ the solder bump of Omote and Hashimoto for a purpose which improves a high-melting point properties of solder attaching to a circuit board.

As to claim 6, Omote discloses the circuit board (1) as shown in figure 4 wherein the thickness of the base layer (7) is 2.0 to 30.0 μ m (column 8, line 67).

As to claim 7, Omote discloses the thickness of the conductive layer is 2.0 to 15.0 μ m.

As to claim 8, Omote discloses the terminal portion (5; 6) further includes a cover layer (8; 26; or 31) disposed on said base layer (7) obvious having a thickness of 0.5 to 8.0 μ m.

Response to Arguments

3. Applicant's arguments with respect to claims 1, 3-11 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues:

(a) Hashimoto teaches a solder bump, and that cannot combine to a terminal in Omote.

(b) there is no motivation for one ordinary skill in the art to turn to a plumbing solder in Lubrano for use in an electrical circuit board.

Examiner disagrees.

Response to argument (a), Omote discloses a suspension substrate (1-figure 1) comprising a terminal (5-figure 2) capable of being as a solder pad for solder mounting on. Hashimoto shows a terminal portion (11) having a solder bump (33) connected to an external portion (32) that would obvious to have teaching's Hashimoto in combine to Omote to show a structure of two devices or circuit boards connected together by using a solder for making physical/electrical connections.

Response to argument (b), Lubrano teaches a lead-free solder having its properties containing weights of tin-silver-copper as well know and conventional as defined by a prior art. The solder has functions for making mechanical/electrical two or more elements together, the solder can be used as electrical connections between two device or circuit boards, or the solder can be used to connect IC chip or die mounted to the circuit board. Thus, the solder has vary own its functions that can be applied in electrical industry or computer. Therefore, the teaching's Lubrano would have been obvious to one in the art to teach the properties of solder applied to Omote and Hashimoto.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 703-306-5856. The examiner can normally be reached on M-F.

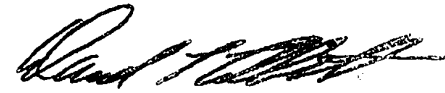
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-305-1341 for regular communications and 703-305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



TD
June 17, 2003.

DAVID L. TALBOT
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2900